

What is claimed is:

1. An apparatus, for heat-processing a mask substrate, comprising:

a heating plate for heating the mask substrate;

5 heating means for heating the heating plate; and

a frame member being detachably disposed to the heating plate so that the frame member faces a side surface of the mask substrate placed on the heating plate when the frame member is attached to the heating plate.

2. The heat processing apparatus as set forth in claim 1,

wherein a clearance is formed between the frame member and the heating plate when the frame member is attached to the heating plate.

3. The heat processing apparatus as set forth in claim 1,

wherein the frame member has a surface opposite to the side surface of the mask substrate placed on the heating plate, and

wherein the surface is curved in a concave shape.

4. The heat processing apparatus as set forth in claim 1,

wherein the frame member has a surface opposite to the side surface of the mask placed on the heating plate, and

wherein the surface is curved in a convex shape.

5. The heat processing apparatus as set forth in claim 3,

wherein the surface is a mirror surface.

6. The heat processing apparatus as set forth in claim 3,

wherein the surface is a rough surface.

7. The heat processing apparatus as set forth in claim 3, further comprising:

a driving mechanism for moving the frame member so that a distance between the frame member and the side surface of the mask substrate placed on the heating plate varies.

8. The heat processing apparatus as set forth in claim 7, further comprising:

means for detecting a temperature of the mask substrate; and

a controlling portion for controlling the driving mechanism in accordance with the detected temperature.

9. The heat processing apparatus as set forth in claim 8,

wherein the controlling portion determines whether the temperature of the mask substrate is in a increasing state or in a constant state in accordance with the detected temperature, controls the driving mechanism so that the distance between the frame member and the side surface of the mask substrate placed on the heating plate becomes a first distance when the

temperature of the mask substrate is in the increasing state and a second distance smaller than the first distance when the temperature of the mask substrate is in the constant state.

5        10. The heat processing apparatus as set forth in claim 1,

         wherein the frame member is divided in a peripheral direction of the mask substrate placed on the heating plate.

10       11. The heat processing apparatus as set forth in claim 1,

         wherein the frame member has:

         a heating mechanism for heating the frame member.

15       12. The heat processing apparatus as set forth in claim 1,

         wherein the mask substrate is an approximately square glass substrate having a side surface of six inches long, and

         wherein the heating plate is a circular plate for  
20       heating a semiconductor wafer having a diameter of 10 inches.

13. A heat processing method for heating a mask substrate placed on a heating plate, comprising the steps of:

25       (a) detecting a temperature of the mask substrate;  
         and

         (b) moving a frame member disposed facing a side

surface of the mask substrate placed on the heating plate, so that a distance between the mask substrate and the frame member varies in accordance with the detected temperature.

5     14. The heat processing method as set forth in claim 13,

          wherein the step (b) has the steps of:

          determining whether the temperature of the mask substrate is in an increasing state or in a constant state based on the detected temperature;

10

          moving the frame member so that the distance becomes a first distance when the temperature is in the increasing state; and

          moving the frame member so that the distance becomes a second distance smaller than the first distance when the temperature is in the constant state.

15